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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/520,067	09/12/2005	Lydie Desperben	SC0909ET	5131

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EXAMINER	
JOSEPH, JAISON	

ART UNIT	PAPER NUMBER
2611	

NOTIFICATION DATE	DELIVERY MODE
04/16/2009	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/520,067	DESPERBEN ET AL.	
	Examiner	Art Unit	
	JAISON JOSEPH	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 December 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

Applicant's arguments filed 12/16/2008 have been fully considered but they are not persuasive.

Regarding claim1, Applicant argues that *"…Applicant respectfully submits that the passage on page 3 lines 28-55 does not specifically refer to a noise estimate comprising a matrix representing the inverse of the noise covariance…"*. However the Office respectfully disagrees. Gerstacker et al teach the limitation of using "noise estimate signal comprises a matrix (w) representing the inverse of noise covariance" (see page 3, equation 8). Channel impulse response $h_{ML} = (A^H \Phi_{nn}^{-1} A)^{-1} A^H \Phi_{nn}^{-1} r$. And Φ_{nn}^{-1} is the noise estimate signal and $\Phi_{nn} = \sigma_n^2 E_{N-L+1}$ wherein σ_n^2 is the noise covariance. Therefore Φ_{nn}^{-1} represent inverse of noise covariance. Therefore Hui et al in views of Gerstacker et al. teach all cited limitations. Therefore the Office maintains the rejection of claim 1.

Applicant further argues "*Combination of Gerstacker with Hui et al. would not lead to the invention of present claims 1, 11 and 20 and Gerstacker teaches away from any such combination. The arrangement proposed by Gerstacker assumes the noise to be white*". However the Office respectfully disagrees. The Office notes that the rejection is not based on anticipation, but is based on obviousness. Gerstacker et al teach estimating the impulse response using the inverse of noise covariance (see page 3, lines 28 – 55). Therefore it would be obvious to an ordinary skilled in the art at the time the invention was made to use inverse noise covariance to estimate the channel impulse response. Furthermore

Hui et al teach the "… channel estimate is generated based on a assumed auto-correlation, such as white noise,…"(see column 3,lines 63 – 64) i.e. Hui et al determining the channels estimate for a colored channel by assuming the channel is white. The person of the ordinary skills in the art would recognize that Gerstacker disclose estimating the impulse response using the inverse of noise covariance and therefore, suggestions to combine the aforesaid references are well within the purview of such person. Therefore Hui et al in views of Gerstacker et al. teach all cited limitations. Therefore, claim 1 stands rejected.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1 – 20 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Hui et al (US Patent 6,674,820) in views of Gerstacker et al (EP 1128617 A1).

Regarding claim 1, Hui et al teach an arrangement for iterative channel impulse response estimation in a system employing a transmission channel, comprising channel impulse response estimation means for producing from a received signal a channel impulse response estimate signal and a noise estimate signal for producing from the received signal a noise signal, said channel impulse

response estimation means is arranges to iteratively respond to noise signal to iteratively produce an improves channel impulse response estimate signal (see abstract). Hui et al does not expressly teach the noise estimate comprises a matrix representing the inverse of noise covariance. However in analogous art, Gerstacker et al teach estimating the impulse response using the inverse of noise covariance (see page 3, lines 28 – 55). Therefore it would have been obvious to an ordinary skilled in the art at the time the invention was made to incorporate the teaching of Gerstacker in Hui et al. the motivation or suggestion to do so is to determine the impulse response accurately.

Regarding claim 2, which inherits the limitations of claim 1, Gerstacker et al further teach wherein said matrix (W) representing the inverse of noise covariance is calculated at each iteration (see equation 8).

Regarding claim 3, which inherits the limitations of claim 1, Gerstacker et al further teach wherein said matrix (W) representing the inverse of noise covariance is selected from predetermined values corresponding to statistics of expected noise.(see page 3, lines 28 -55) .

Regarding claim 4, which inherits the limitations of claim 2, Gerstacker et al further teach wherein the channel impulse response estimate signal is represented by: (HH .W.H)-I .HH .W.y, where H represents a matrix depending on known symbols, y represents a vector of received channel samples, and W represents the inverse noise covariance matrix (see page 3, lines 28 – 55).

Regarding claim 5, which inherits the limitations of claim 4, Hui et al further teach wherein said matrix (W) representing the inverse of noise

covariance is selected from predetermined values corresponding to statistics of expected noise; and wherein the predetermined values corresponding to statistics of expected noise are selected according to the noise types: Gaussian, upper adjacent interferer, lower adjacent interferer, or co-channel interferer (see abstract).

Regarding claim 6, which inherits the limitations of claim 1, Hui et al further teach wherein the channel impulse response estimation means is arranged to produce the channel impulse response estimate signal (/3) as a weighted least square function (see column 3, lines 51 – 53).

Regarding claim 7, which inherits the limitations of claim 1, Hui et al further teach wherein the system is a wireless communication system (see column 1, lines 19 – 20).

Regarding claim 8, which inherits the limitations of claim 7, Hui et al further teach wherein the system is a GSM system (see column 1, lines 19—20).

Regarding claim 9, which inherits the limitations of claim 7, wherein the system is an EDGE system (official notice is taken).

Regarding claim 10, Hui in view of Gerstacker et al teach A receiver for use in a system employing a transmission channel, the receiver comprising the arrangement of any preceding claim 1 (see abstract)..

Regarding claim 11, the claimed method including the features corresponds to subject matter mentioned above in the rejection of claim 1 is applicable hereto.

Regarding claim 12, which inherits the limitations of claim 11, the claimed method including the features corresponds to subject matter mentioned above in the rejection of claim 2 is applicable hereto.

Regarding claim 13, which inherits the limitations of claim 11, the claimed method including the features corresponds to subject matter mentioned above in the rejection of claim 3 is applicable hereto.

Regarding claim 14, which inherits the limitations of claim 12, the claimed method including the features corresponds to subject matter mentioned above in the rejection of claim 4 is applicable hereto.

Regarding claim 15, which inherits the limitations of claim 14, the claimed method including the features corresponds to subject matter mentioned above in the rejection of claim 5 is applicable hereto.

Regarding claim 16, which inherits the limitations of claim 11, the claimed method including the features corresponds to subject matter mentioned above in the rejection of claim 6 is applicable hereto.

Regarding claim 17, which inherits the limitations of claim 11, the claimed method including the features corresponds to subject matter mentioned above in the rejection of claim 7 is applicable hereto.

Regarding claim 18, which inherits the limitations of claim 17, the claimed method including the features corresponds to subject matter mentioned above in the rejection of claim 8 is applicable hereto.

Regarding claim 19 which inherits the limitations of claim 17, the claimed method including the features corresponds to subject matter mentioned above in the rejection of claim 29 is applicable hereto.

Regarding claim 20, Hui et al further teach the method of claim 11 can be executed via software (see column 11, lines 21 - 40).

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JAISON JOSEPH whose telephone number is (571)272-6041. The examiner can normally be reached on M-F 9:30 - 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chieh Fan can be reached on (571) 272-3042. The fax

phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/J. J./
Examiner, Art Unit 2611

/Chieh M Fan/

Supervisory Patent Examiner, Art Unit 2611